Notes on the PSG species belonging to the tribe Anisomorphini sensu Bradley & Galil, 1977, with a list and key to the genera (Phasmatodea: Pseudophasmatidae: Pseudophasmatinae)

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Abstract
The neotropical tribe Anisomorphini sensu Bradley & Galil, 1997 have always been a taxonomically problematic group. The authors published a revision of the tribe (Conle & Hennemann, 2002), which affects the systematic position or scientific name of some cultured species. The following paper provides a list of all genera belonging to Anisomorphini as well as determination keys to the males and females. Special reference is made to the identity of species included on the PSG culture-list, with the valid names being listed, along with information on each culture's history and origin.

Key words
Phasmida, Phasmatodea, Pseudophasmatidae, Pseudophasmatinae, Anisomorphini, genera, type-species, key, PSG species, identity.

Introduction

As arranged by Bradley & Galil (1977), the neotropical tribe Anisomorphini has always been a taxonomically problematic group. Since Redtenbacher´s (1906) treatment of the genera and species belonging to this group, no further studies of revisional nature have been made, and most species described subsequently were simply included in either *Anisomorpha* Gray, 1835 or *Autolyca* Stål, 1875 which have both consequently become polyphyletic genera.

Therefore a revision of the tribe at species-level seemed necessary and, since starting to visit numerous European museums in the early 1990s in order to photograph their type specimens, the authors began extensive research on the group. The recent publication of this revision (Conle & Hennemann, 2002) brought about numerous taxonomic changes, some of which concern species included on the PSG culture-list. The following paper summarizes those taxonomic changes which affect PSG species and lists the current valid names, along with information on each culture's history and origin. Additionally a list of all genera belonging to the Anisomorphini as well as determination keys for the males and females are included.

The current paper is meant as a first step for identification of taxa belonging to this tribe on generic level. It is especially hoped that it will to be of use for PSG-members and other people importing livestock of Anisomorphini from their holidays or expeditions.

Genera of Anisomorphini

Alloeophasma Redtenbacher, 1906: 126. Type-species: *Anophelepis poeyi* Saussure, 1868: 67, by subsequent designation of Conle & Hennemann, 2002: 17.

Anisomorpha Gray, 1835: 13 & 18. Type-species: *Phasma buprestoides* Stoll, 1813: 68, by subsequent designation of Kirby, 1904: 401.

Atratomorpha Conle & Hennemann, 2002: 30. Type-species: *Anisomorpha atrata* Hebard, 1919: 145, by original designation.

Autolyca Stål, 1875: 56 & 95. Type-species: *Autolyca pallidicornis* Stål, 1875: 95, by subsequent designation of Kirby, 1904: 402.

Columbiophasma Conle & Hennemann, 2002: 41. Type-species: *Bacteria quindensis* Goudot, 1843: 5, by original designation.

Decidia Stål, 1875: 96. Type-species: *Phasma soranus* Westwood, 1859: 127, pl. 17: 3, by subsequent designation of Kirby, 1904: 403.

Malacomorpha Rehn, 1906: 113. Type-species: *Malacomorpha androsensis* Rehn, 1906: 22, by monotypy.

Monticomorpha Conle & Hennemann, 2002: 53. Type-species: *Autolyca flavolimbata* Redtenbacher, 1906: by original designation.

Neophasma Redtenbacher, 1906: 124. Type-species: *Neophasma subapterum* Redtenbacher, 1906: 125, by subsequent designation of Zompro, 2000: 93.

Paranisomorpha Redtenbacher, 1906: 90. Type-species: *Paranisomorpha insignis* Redtenbacher, 1906: 90, by monotypy.

Peruphasma Conle & Hennemann, 2002: 91. Type-species: *Autolyca pentlandi* Redtenbacher, 1906: 95, by original designation.

Pseudolcyphides Karny, 1923: 234. Type-species: *Phasma spinicolle* Burmeister, 1838: 585, by original designation.

Key to the genera of Anisomorphini

Females

1. Caribbean Islands. 2
- Southern USA, Central and South America. 4
2. Tergites smooth. 3
- Tergites with posteromedial tubercle; body granulated. . . . . *Malacomorpha*
3. Mesonotum smooth; at least 2x as long as pronotum. . . . . *Alloeophasma*
- Mesonotum spined; at best 1.5x as long as pronotum. . . . . *Pseudolcyphides*
4. Profemora distinctly curved and depressed basally 5
- Profemora more or less straight, not depressed basally 6
5. Operculum short, at best reaching half of anal segment; basitarsus indistinctly longer than second segment; Southern USA and Central America. . . . . *Anisomorpha*
- Operculum long, apically pointed and reaching posterior margin of anal segment; basitarsus at least 2x as long as second segment; South America. . . . . *Neophasma*
6. Medium-sized to large, slender insects; Central America and Northern Columbia. 7
- Small to very small, stout or compact insects; South America. 9
7. Antennal segments cylindrical and parallel-sided. 8
- Antennal segments knob-like thickened apically . . . . . *Paranisomorpha*
8. Profemora longer than head, pro- and mesonotum combined; basitarsus 3x as long as second tarsomere; alate. . . . . *Decidia*
- Profemora shorter than head, pro- and mesonotum combined; basitarsus at best 2x as long as second tarsomere; apterous. . . . . *Autolyca*
9. Tergites II-VII smooth. 10
- Tergites II-VII with posteromedial tubercle. 11
10. Very small, compact insects; legs short, edges rounded; body smooth, glossy. . . . . *Monticomorpha*
- Medium sized insects; legs elongate, distinctly carinated; body densely setose. . . . . *Peruphasma*
11. Mesonotum with prominent spines; body smooth and glossy. . . . . *Atratomorpha*
- Mesonotum without distinct spines; body granulose. . . . . *Columbiophasma*

Males

[The male of *Decidia* Stål, 1875 is not yet known].

1. Caribbean Islands. 2
- Southern USA, Central and South America. 4
2. Tergites smooth. 3

- Tergites with posteromedial tubercle; body granulated. . . . . *Malacomorpha*
3. Mesonotum smooth; at least 2x as long as pronotum. . . . . *Alloeophasma*
- Mesonotum spined; at best 1.5x as long as pronotum. . . . . *Pseudolcyphides*
4. Profemora distinctly curved and depressed basally 5
- Profemora more or less straight, not depressed basally 6
5. Subgenital plate small, not convex; basitarsus indistinctly longer than second tarsomere; Southern USA and Central America. . . . . *Anisomorpha*
- Subgenital plate strongly convex, cup-like; basitarsus at least 2x as long as second tarsomere; South America. . . . . *Neophasma*
6. Tergite IX with forceps-like, posterolateral lobes, Central America. 7
- Tergite IX without lateral lobes; South America. 8
7. Antennal segments cylindrical, parallel-sided; body smooth and glossy. . . *Autolyca*
- Antennal segments knob like, thickened apically; body granulose. . .*Paranisomorpha*
8. Anal segment simple, without lateral spine. 9
- Anal segment with distinct, finger-like lateral spine. . . . . *Columbiophasma*
9. Tergites II-VII smooth; mesonotum smooth. 10
- Tergites II-VII with posteromedial tubercle; mesonotum with distinct spines. . . . . *Atratomorpha*
10. Very small, compact insects; legs short, edges rounded; body smooth, glossy. . . . . *Monticomorpha*
- Medium sized; legs elongate distinctly carinated; body densely setose. . *Peruphasma*

Comments and identities of species included on the PSG culture-list

PSG 12: *Anisomorpha buprestoides* (Stoll, 1813)

This species is very variable in size and coloration and seems to have developed numerous varieties which may perhaps be regarded as geographical races. There are mainly two colour-forms, one clearly black and white striped, and relatively larger, from Florida and a smaller brownish colour-form in which the stripes are less distinct or almost absent from regions north of Florida. Although quite common in some places, *A buprestoides* is restricted to Key West, Florida and Georgia. Other records are usually misidentifications of the very similar *Anisomorpha ferruginea* (Palisot de Beauvois, 1821), which may however be distinguished from *A. buprestoides* by its smaller size, stouter body, less distinct stripes on the body and lacking the black lateral band on the anal segment.

This species seems to have been imported to Europe several times since the 1970s and has subsequently been successfully reared by many breeders. The original culture stock PSG 12 originated from Florida, however there is no information available on when or by whom the origin insects or eggs were collected. The original PSG 12 represented the large, black and white striped variety of *A. buprestoides* while later imports included the smaller, brownish variations from Georgia.

Although some stock readily feed on bramble (*Rubus* spp.) others seem to feed exclusively on privet (*Ligustrum* spp.) or rhododendron (*Rhododendron* spp.).

PSG 50: *Peruphasma sp.* ?

This Peruvian species was apparently never in culture but included on the PSG species-list as "*Paranisomorpha* sp. PSG 50". According to its locality it most probably represented a member of *Peruphasma* Conle & Hennemann, 2002 instead of *Paranisomorpha* Redtenbacher, 1906 which is restricted to Central America.

PSG 122: *Anisomorpha paromalus* Westwood, 1859
= *Anisomorpha monstrosa* Hebard, 1932: 214. [synonymised by Conle & Hennemann, 2002: 28].
The culture stock of this attractive black and orange species was collected in Belize (formerly known as British Honduras) in the early 1990s and referred to as "*Anisomorpha* sp." or a dark variety of *A. buprestoides* (Stoll, 1813). It was originally reared by M. Lazenby & F. Holloway and subsequently identified as *Anisomorpha monstrosa* Hebard, 1932 by Brock (1995: 6).

Comparison of cultured specimens of PSG 122 with the types of *Anisomorpha paromalus* Westwood, 1859 in the British Museum of Natural History, London proved these two taxa to be synonymous (Hennemann & Conle, 2002). As Westwood´s name is the older one, Hebard´s name is a junior synonym, with *A. paromalus* being the valid name for PSG 122.

The type locality of *A. monstrosa* Hebard is Mexico, Merida, Yucatan, which is very close to Belize where the culture stock was collected. *A. paromalus* Westwood was described from Venezuela, a locality which is presumably wrong.

PSG 191: *Neophasma borellii* (Giglio-Tos, 1897)
The original eggs of this culture stock were laid between 3rd and 8th January 1997 by a female collected in Paraguay, Dept. Paraguari, Sapucay and sent to Frank Hennemann by a local supplier. The stock was parthenogenetic and seems to have died out after a few generations. Insects were feeding exclusively on privet (*Ligustrum* spp.).

PSG 198: *Anisomorpha ferruginea* (Palisot de Beauvois, 1821)
This species is widely distributed in the USA including Texas, Louisiana, Mississippi, Tennessee, Oklahoma, Kentucky, Georgia, South- and North Carolina and parts of Georgia, it is however absent in Florida. Specimens are often misidentified as *A. buprestoides* (Stoll) which is restricted to Florida and Georgia and distinguished by its larger size, more distinctly striped and elongate body and distinct black lateral band of the anal segment.

Due to its wide geographic distribution it has developed several varieties which may rank as geographic races or subspecies. Culture stock seems to have been imported to Europe two times, the first originated from Mississippi. The stock feeds on bramble (*Rubus* spp.) and privet (*Ligustrum* spp.).

PSG 213: *Malacomorpha jamaicana* (Redtenbacher, 1906)
This species is commonly found in Jamaica, from where the present stock was brought into culture by Tony James. It is extremely productive and easy to rear, feeding on bramble (*Rubus* spp.) and privet (*Ligustrum* spp.). Although apterous, a single female of the type series in NHMW possesses rudimentary tegmina and alae.

PSG 220: *Malacomorpha cyllarus* (Westwood, 1859)
This species is very similar and closely allied to *M. jamaicana* (Redtenbacher, 1906), but differs at first sight by the existence of tegmina and alae and the slightly paler body colour. The present stock was also brought to Europe by Tony James who collected it in Jamaica. It seems to feed exclusively on privet (*Ligustrum* spp.).

Correction to Conle & Hennemann, 2002, plate VII, fig. 73 and p. 109
The photo of the male holotype of *Neophasma vittata* (Toledo-Piza, 1939) in the Escola Superior de Agricultura "Luis de Queiroz", Sao-Paulo, Brazil was kindly provided by O.

Zompro (Max-Planck-Institut für Limnologie, Plön). This is not clearly mentioned in the acknowledgements on page 109.

Instructions on how to order this revision follow the references.

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How to order the revision of Anisomorphini

Conle, Oskar V. & Frank H. Hennemann (2002): Revision neotropischer Phasmatodea: Die Tribus Anisomorphini sensu Bradley & Galil 1977. (Insecta, Phasmatodea, Pseudophasmatidae). *Spixiana*, Supplement No. 28, 141 pages, 19 plates. ISBN 3-89937-001-5 Price: Euro 30.00 / US$ 39.00. This publication may be ordered from:

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Wolfratshauser Str. 27
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